



International African Institute

Wheeled Transport in Pre-Colonial West Africa

Author(s): Robin Law

Source: *Africa: Journal of the International African Institute*, Vol. 50, No. 3 (1980), pp. 249-262

Published by: [Cambridge University Press](#) on behalf of the [International African Institute](#)

Stable URL: <http://www.jstor.org/stable/1159117>

Accessed: 15/06/2014 04:05

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Cambridge University Press and International African Institute are collaborating with JSTOR to digitize, preserve and extend access to *Africa: Journal of the International African Institute*.

<http://www.jstor.org>

WHEELED TRANSPORT IN PRE-COLONIAL WEST AFRICA*

Robin Law

One of the most important differences in technology between Africa south of the Sahara during the pre-colonial period and many other areas of the world, it is frequently suggested, was the almost complete absence in the former of any form of wheeled transport. The transport of goods overland in pre-colonial sub-Saharan Africa was normally done by pack animals, where these were available, or more generally by human portage. This lack of wheeled transport, it might be argued, had crucial implications for the history of sub-Saharan Africa, since the high cost of transport by pack animals and human portage has often been presented as one of the principal constraints upon the expansion of trade, and hence of economic growth generally, in pre-colonial times¹. The lack of wheels in sub-Saharan Africa, it is clear, cannot have been due simply to ignorance, since many areas of the continent had been in contact with wheel-using civilizations outside Africa for several centuries before the colonial conquest at the end of the nineteenth century. Indeed, as this article will show, there is abundant evidence that, in West Africa at least, the technology of wheeled transport was quite widely known, though put to only very limited use, in the pre-colonial period. The reasons why this technology, although readily available, was nevertheless not generally adopted are, however, very far from being clear.

The non-adoption of the wheel in pre-colonial Africa, despite its obviously central importance for an understanding of the character of African societies, has attracted surprisingly little attention from historians of the continent. Many general histories of Africa, indeed, fail altogether to mention the absence of the wheel, far less to offer any explanation of it². In so far as the problem has been considered, the non-adoption of the wheel has been interpreted in two very different ways. On the one hand, ignorance of the wheel has been cited, along with the persistence into the nineteenth century of such institutions as cannibalism and slavery, as an index of the backwardness of African societies (e.g. Bauer, 1966:47). The implication appears to be that, since the wheel evidently represented a superior technology of transport, Africans in failing either to invent it or to adopt it from others exhibited a lack of initiative, or at least a lack of concern for economic progress. On the other hand, those who are convinced of the essential economic rationality of pre-colonial African societies argue that the non-adoption of the wheel must have been due to environmental or other conditions which rendered its use uneconomic. For example, a study of the history of wheeled transport, written by a Marxist scholar, asserts that the wheel was not adopted in sub-Saharan Africa 'because the economic conditions for the use of draught vehicles were lacking' (Tarr, 1969:78). However, since the supposed inhibiting conditions are not specified, this conclusion presumably derives more from the author's general commitment to

* This article is a by-product of a larger study of the role of the horse in pre-colonial West Africa, to be published by the International African Institute under the title *The horse in West African history*. The writer's thanks are due to John Reid, of the University of Stirling, who drew his attention to several of the references to wheels in West Africa cited in the article.

economic determinism than from an actual study of African conditions. The pioneer economic historian of West Africa, Allan McPhee, suggested that in the coastal areas of West Africa the use of wheeled vehicles was not feasible because of the lack of draught animals, due to the heavy mortality of domestic stock in the forest zone through trypanosomiasis, the disease transmitted by the tsetse fly (McPhee, 1926:107). This argument, however, would not account for the absence of wheels in some other areas of Africa, including the West African interior, where trypanosomiasis was less pervasive and potential draught animals such as oxen and horses were kept in considerable numbers. Among recent studies, the only systematic attempt to confront the problem of African wheel-lessness is that offered by A. G. Hopkins in his *Economic History of West Africa*. Hopkins argues that even in those areas of West Africa where potential draught animals were available wheeled transport was uneconomic because 'its greater cost was not justified by proportionately greater returns', and more particularly because 'the poor quality of the roads would have greatly reduced the efficiency of wheeled vehicles, and the cost of improving the road system would have been prohibitive'. He concludes that 'pack animals predominated because they were relatively cheap to buy, inexpensive to operate and well suited to the terrain' (Hopkins, 1973:74-5; cf also Fage 1978:19).

The present article attempts to throw some light on this problem by examining what is known of actual attempts to introduce wheeled transport in various areas of West Africa during the pre-colonial period. It will be shown that the technology of the wheel was readily available to West African societies, had they wished to adopt it; and that in several instances West Africans did in fact show an active interest in acquiring wheeled vehicles; but also that such wheeled vehicles were seldom put to any effective practical use.

Early wheeled transport in the Sahara

It is illuminating to consider first the history of the original introduction of wheeled transport into northern Africa. Wheeled transport first arrived in the African continent in the form of the horse-drawn war chariot, which seems to have been introduced into Egypt from Asia during the second quarter of the second millennium B.C. (Tarr, 1969:68). From Egypt, the use of the war-chariot spread westwards into the rest of northern Africa: it was known in Cyrenaica (eastern Libya) by the twelfth century B.C.,³ and was in use in the Maghreb by the time of the earliest extant description of conditions in the area in the fifth century B.C. (Herodotus, iv.193). The use of wheeled vehicles for peaceful purposes, to transport heavy loads, apparently developed in northern Africa only after the introduction of the war-chariot, though the precise chronology of its spread is obscure. Horse-drawn vehicles were used exclusively for military and ceremonial purposes: horses could not be used at this period for heavy draught work because the yoke harness then in use (developed originally for use with oxen) tended to throttle horses when they pulled heavy loads, and the efficient use of horses for heavy draught only became possible with the development of the modern forms of horse harness, utilizing a collar or breast-strap rather than a yoke, in the first millennium A.D.⁴ Heavy loads were therefore moved by ox-drawn carts.

From northern Africa, the use of wheeled vehicles spread southwards across the Sahara towards West Africa. The use of war-chariots in the northern Sahara is mentioned in literary sources of the fifth century B.C. (Herodotus iv.183,4) and of the

first century A.D. (Strabo xvii.3,7). There are also numerous rock engravings and paintings of wheeled vehicles at sites in the central and western Sahara.⁵ Although many modern accounts give the impression that the vehicles depicted in Saharan art are mainly horse-drawn chariots (e.g. Law 1967:181–182), they in fact include many ox-drawn carts also. In many instances the draught animals are not shown, or are depicted in such a stylized manner that identification is impossible, but it appears that the horse-drawn chariots are restricted to the central Saharan sites and that the wheeled vehicles depicted in the western Sahara are normally drawn by oxen. (See Lhote 1957; esp. 630; Munson 1969). Knowledge of the wheel seems to have spread right across the Sahara, the most southerly depiction of a wheeled cart found to date being a rock engraving at Tondia, near Goundam to the north-west of the Niger bend (Mauny 1947:344, with fig. 2 no. 22).

However, the use of wheeled vehicles seems to have gone completely out of use in the Sahara during the first millennium A.D. This involved two distinct processes: the replacement of horse-drawn war-chariots by horse-riders for military purposes, and the replacement of ox-drawn carts by pack animals for the transport of goods. The former poses no great problems of explanation, since the displacement of chariotry by cavalry occurred not only in the Sahara but all over the world,⁶ and evidently reflects the superior military effectiveness of the mounted warrior. In the Maghreb it appears that war-chariots went out of use during the third century B.C.,⁷ but in the Sahara they may have continued in use rather longer, being mentioned there (as noted above) in an account of the first century A.D.⁸ The demise of the ox-drawn cart is much more difficult to account for. The supersession of chariots by cavalry in warfare in no way compromised the utility of wheeled vehicles for transport in other contexts. In the Maghreb, indeed, it is clear that wheeled vehicles remained in normal use long after the disappearance of the war-chariot: such 'waggon' (*plaustra*), presumably ox-drawn, are mentioned, for example, in a Roman description of the Maghreb written in the late first century A.D. (Pliny v.22). In the Sahara also, it seems likely that the ox-drawn cart survived in use considerably longer than the horse-drawn war-chariot: it can be suggested, partly on stylistic grounds, that in the western Sahara (where, it will be remembered, rock art normally depicts ox-drawn rather than horse-drawn vehicles) the latest rock engravings of wheeled vehicles may be contemporary with the earliest engravings depicting the camel, an animal which is unlikely to have been common in this area before about the fourth century A.D. (cf Mauny 1947:353, Lhote 1953, 1179–1180). It is probable, in fact, that it was precisely the introduction of the camel which rendered wheeled transport obsolete in the Sahara. In an important study, R. W. Bulliott has pointed out that the disappearance of wheeled vehicles in the Sahara was not altogether unique: wheeled transport appears to have become very uncommon, though not disappearing so completely as in the Sahara, in other areas of the Middle East also, including northern Africa, in early medieval times. Bulliott shows that the disappearance of the wheel coincided broadly with the introduction of the camel, and argues that the camel drove out the wheel for the straightforward reason that camels with pack saddles could shift goods more efficiently and cheaply than ox-drawn carts (Bulliott 1975:7–27).

The history of wheeled transport in the Sahara, obscure as it is, is of considerable interest for the case of sub-Saharan West Africa. Even if the reasons for the disappearance of the wheel from the Sahara remain, in the absence of detailed

contemporary documentation, ultimately a matter for speculation, the very fact of this disappearance may be held to support the suggestion that the supposed advantages of adopting wheeled transport were by no means always self-evident.

It is doubtful whether the use of the wheeled vehicles ever spread in early times into sub-Saharan West Africa. The few rock engravings and paintings reported from south of the Sahara, though they depict both horses and oxen, do not include any representation of a wheeled vehicle. Rock engravings at Kourki to the south of the Niger bend, in the extreme west of the Republic of Niger, do depict horse-riders in association with objects which might be interpreted as spoked wheels, but these might equally be (and more probably are) symbols of some magical significance (Rouch 1949: esp. 344). None of the early Arabic accounts of West Africa suggests the use of wheeled transport there, though admittedly none explicitly notes the absence of wheels either.⁹ The only suggestion of wheeled transport in early times in West Africa is in a tradition of the Dogon, in the south of the Republic of Mali, which reportedly recalls an invasion of their country by white or 'red' men from the north who used horse-drawn chariots.¹⁰ This tradition might possibly incorporate a recollection of the horse-drawn war-chariots used in early times in the Sahara, but it is suspicious in its uniqueness, and seems more likely to be the result of 'feedback' from modern published accounts of the chariots depicted in Saharan art.

However, from the fifteenth century onwards West Africa came into contact with an alternative supplier of the technology of wheeled transport, through the Atlantic trade with the societies of western Europe. On several occasions Europeans did, in fact, bring wheeled vehicles to West Africa.

Ceremonial wheeled carriages in sub-Saharan West Africa

In most cases, the wheeled vehicles imported into West Africa from Europe were carriages intended for ceremonial use. The earliest instance appears to have been in 1670, when the French Compagnie des Indes Occidentales presented to the king of Allada, in what is now the Republic of Benin, a gilded carriage, 'together with the harness and bits for the horses' (d'Elbée 1671:391; cf. 406). An eighteenth-century writer inferred from this gift that wheeled carriages were already known in Allada, having presumably been introduced there by the Portuguese,¹¹ but there is nothing to support this view in the original account of the gift in 1670.¹² It is more probable that a carriage was judged a suitable present simply because it was known that horses were kept in Allada.¹³ Unfortunately there is no record of whether or how the king of Allada ever made any use of his wheeled carriage.¹⁴

It seems likely that the carriage imported into Allada in 1670 created a sort of tradition, for when we next hear of wheeled carriages in West Africa, about a century later, it is in the same area, in the kingdom of Dahomey which had superseded Allada as the principal state in the region in the early eighteenth century. A European visitor to Abomey, the capital of Dahomey, in 1772 saw two coaches, each drawn by twelve men, in a ceremonial procession (Norris 1789:110; repeated in Dalzel 1793:137). The use of men rather than horses to draw these coaches is of interest: although horses were known in Dahomey they were not numerous,¹⁵ and were presumably considered too valuable to employ in such heavy work. The use of wheeled carriages seems to have been continuous in Dahomey from then until the late nineteenth century. Later in the eighteenth century, king Agonglo (1789–1797) is said to have acquired a carriage,

which was still preserved at Abomey in the 1870s (Skertchly 1875:260). In the nineteenth century, various European visitors to Abomey—notably Forbes (1849–50), Burton (1863–4) and Skertchly (1871)—saw large numbers of wheeled vehicles displayed in ceremonial processions there (Forbes 1851: esp. I, 18 & II, 34, 65, 215–224, 233–239; Burton 1966: esp. 186, 249–250; Skertchly 1875:157, 260–261). These included carriages of various sizes, down to a Bath chair; a twenty-foot long model of a trading ship mounted on wheels; a huge wooden elephant on wheels; and wheeled sculptures of horses and warriors. They were invariably drawn by men (or, often, by the king's wives), and seem to have been used exclusively in ceremonies, sometimes to convey the king but more generally to display his wealth and magnificence. Burton noted that the road between Abomey and the neighbouring town of Cana (also a royal residence), a distance of some six or seven miles, was kept carefully clear of grass 'for the convenience of the royal carriages' (Burton 1966:168). Most of the wheeled items in Dahomey were clearly imports, many of them obtained as gifts from foreign governments or traders: the success of Consul Burton's mission to Abomey in 1864 was jeopardized by his failure to bring a carriage as a present, as king Glele had expected (Burton 1966:191; cf. 349). It is of great interest, however, that some are said to have been of local manufacture. Forbes reports seeing in 1850 'a glass-coach, the handiwork of Hoo-ton-gee, a native artist—a square with four large windows, on wheels', and also '... [a] wheeled-chair with a huge bird before it, on wheels of Dahomey make ... [a] warrior on wheels, Dahomey make, ... [and a] Dahoman-made chair on wheels, covered with handsome country cloth' (Forbes 1851:II, 65, 236, 237, 239). Burton in 1864 likewise noted carriages 'of home, or native manufacture', including 'a blue-green shandridan, with two short flagstuffs attached to the front' (Burton 1966:249). Skertchly in 1871 saw 'a dark green coach, evidently of native manufacture', probably the same one noticed earlier by Burton, and also an imported coach on which the rear wheels had been replaced by a pair of local workmanship (Skertchly 1875:260).

No other pre-colonial West African society seems to have accumulated wheeled vehicles on the same scale as Dahomey. However, in the nineteenth century wheeled carriages could be found in use in several other parts of West Africa also. In the British colony of Freetown, in Sierra Leone, the wealthy regularly maintained horse-drawn carriages for purposes of recreation, until the horses were eliminated by the great trypanosomiasis epidemic of 1856–1858 (Fyfe 1962:145, 166, 294). Likewise in the Gold Coast in the 1830s and 1840s British officials and local merchants occasionally kept wheeled carriages, though here in the absence of horses (which tended to die off rapidly after importation into the area) they were drawn as in Dahomey by teams of men (Laird & Oldfield 1837:I, 49; Schön & Crowther 1842:18; Allen & Thompson 1848:II, 182; Cruickshank 1853:I, 219). Freetown and the Gold Coast were, of course, strictly colonial rather than indigenous West African societies. But wheeled vehicles were also used at least occasionally beyond the limits of European administration.

An interesting case is the kingdom of Asante, in the hinterland of the Gold Coast. In 1816 the Governor-General of the Dutch forts on the Gold Coast wrote to the king of Asante urging the introduction of horse-drawn carriages, but it does not appear that anything came of this (Wilks 1975:34, 163). In 1841, however, the Methodist Missionary Society actually delivered a present of a wheeled carriage to Kumase, the capital of Asante. The delivery of the carriage proved a difficult task. Initially an

attempt was made to head-load the carriage along the path, but the work proved too onerous for the porters and instead the carriage was transported on its own wheels. For this, it proved necessary in effect to construct a new road all the way to Kumase, clearing vegetation and other obstacles along the path and bridging the intervening streams (Freeman 1844:esp. 97, 99, 100, 102, 118). Even in Kumase itself the carriage faced difficulties, owing to the narrowness of the streets, and on its arrival the king was obliged to order 'new streets to be made, passable for the carriage' (Freeman 1844:188). A few years later the king was reported to be using the carriage for some of his public appearances in Kumase, but unfortunately the account does not make clear whether it was drawn by horses or by men.¹⁶

Further east, in what is now south-western Nigeria, the king of Lagos is reported to have sent a request for 'a large carriage in good condition' to the Emperor of Brazil in 1824, though it is not clear whether he ever received it. (Verger 1976:242). At Old Calabar, in south-eastern Nigeria, king Eyamba V likewise imported two wheeled carriages, together with horses to draw them, in the 1840s. The horses, however, soon died, and he had the carriages drawn instead by teams of men. As in Kumase, it is reported that the utility of the carriage was greatly restricted by the narrowness and unevenness of the streets in Old Calabar (Hutchinson 1858:117-118; Waddell 1863:246, 263-264).

Carriages were much less common in the interior of West Africa than in the coastal areas. At least one European wheeled carriage did, however, find its way across the Sahara into what is now north-eastern Nigeria, to the kingdom of Borno. A wheeled carriage was seen displayed in ceremonial processions at Kukawa, the capital of Borno, by the German explorers Rohlfs in 1866 and Nachtigal in 1870; according to Nachtigal, it was drawn by a mule. Nachtigal was given to understand that it had been presented to the Shehu of Borno by the British exploring expedition led by Richardson and Barth in 1851. Rohlfs promised the Shehu that the German government would supply a second carriage, but in the event Nachtigal did not deliver the promised vehicle (Bohner 1934:78-79; Nachtigal 1979:131, 282-283).

The movement of heavy loads

There appears to have been much less interest in the use of wheeled vehicles to transport goods, as opposed to people. The only clear instance in an indigenous West African society which I have been able to trace relates to the military rather than to the commercial sphere. An army of Dahomey operating against Badagry in 1845 is reported to have taken with it a 'cart', presumably wheeled, to carry a 500-foot long chain intended for the securing of prisoners. In the event, however, this cart was captured by the Badagrians.¹⁷

Other recorded attempts in the nineteenth century to make use of wheeled carriages to transport goods occurred in colonial rather than indigenous societies. A series of attempts was made, in particular, in the Gold Coast. In the early 1840s it is recorded that an African merchant operating in the Anomabo area—'a very intelligent and highly respectable native merchant, named Barnes', probably to be identified with Henry Barnes—procured carriages from England to convey timber down to the coast for export, and at his own expense constructed a road about ten or twelve miles into the interior for the carriages to use. However, this venture failed, reportedly because after the abolition of domestic slavery by the British authorities Barnes was unable to obtain

a sufficient supply of labourers to draw the carriages (Duncan 1847:I, 45–46). In the 1860s the Basel Mission at Christiansborg established workshops to build wheeled carts, imported oxen to draw them, and embarked upon the construction of roads for the carts to use. But this project had little commercial impact, and the road-building effort was soon abandoned (Dickson 1971:219, 228; Reynolds 1974:158). In the 1880s a mining company operating in the Tarkwa district introduced two wheeled trucks in order to convey heavy machinery into the interior. At the first attempt, it took 57 men a fortnight to transport one and a half tons of machinery a distance of 70 miles, provoking the comment that ‘at this rate, of course, it would never pay to use trucks’. But after improvements in the road, through the clearing of vegetation and the laying of logs over swampy ground, it proved possible to reduce the travelling time to three days, which was pronounced satisfactory.¹⁸

The general failure to adopt wheeled vehicles for the transport of goods is especially striking in view of the fact that the nineteenth century brought a massive expansion of exports of agricultural produce, especially palm oil, from West Africa to Europe and America, which might be expected to have stimulated an interest in improved methods of transport. The only innovation in the techniques of transport which was widely adopted in West Africa, prior to the introduction of the railway, was in fact the practice of rolling barrels of produce along the roads. Since this practice represented, in McPhee’s words, an ‘approach to the use of the friction-minimising circle’ akin to the wheel (McPhee 1926:107), it should be at least briefly mentioned in this context. Barrels had, of course, been moved by rolling over short distances at the coast from quite early times,¹⁹ but the rolling of barrels over substantial distances from the interior to the coast was apparently an innovation of the late nineteenth century. The practice is associated especially with the Gold Coast, where it is said to have been introduced by African traders bringing palm oil and kernels to Accra, using a road constructed a few years earlier by the colonial government, in 1891.²⁰ The practice was also known in the Dahomey area, though probably not until after the French conquest in the early 1890s.²¹ It is noteworthy that when Mr Provensal, the Gold Coast trader who claimed to have pioneered the rolling of barrels to Accra, was urged by the British Governor to adopt the use of wheeled carts he refused on the grounds that ‘they would be too expensive’. In addition to the outlay on the purchase and repair of carts, he argued that the poor quality of the roads would oblige him to employ prohibitively large gangs of labourers to handle them: ‘it would take eight men to a cart, allowing for the carts going into ditches, or, in wet weather, sticking in ruts; therefore, he said, he certainly should not use carts’.²²

Wheeled gun-carriages

The one field in which indigenous West African societies did show some interest in putting wheeled vehicles to practical use was in warfare, in the employment of wheeled carriages to transport cannon. Some West African rulers were acquiring occasional items of European artillery from the seventeenth century onwards, but there is no evidence for the use of wheeled gun-carriages before the nineteenth century.²³

Perhaps the earliest wheeled gun-carriages used in West Africa outside the European coastal forts were two constructed for the Shehu of Borno in 1823. These were built by William Hillman, a carpenter accompanying the British exploring party led by Denham, with the assistance of local blacksmiths. ‘The wheels’, it is reported,

'were subjects of great wonder'. In the following year, the Borno army employed the two cannon mounted by Hillman in a campaign against Bagirmi (Denham and Clapperton 1826: Denham's narrative, 201, 249). Later in the nineteenth century, wheeled gun-carriages were still being manufactured by local craftsmen in Borno, though it does not appear that they were being used in actual warfare. Nachtigal, visiting the Borno capital Kukawa in 1870, found six cannon at the Shehu's palace mounted on 'damaged carriages of crude local manufacture', provoking 'justifiable doubts about their transportability', and also saw in a ceremonial procession there 'a small shabby cannon on a low gun-carriage of local manufacture, with clumsy wooden discs instead of wheels, laboriously dragged over the uneven ground by two small melancholy mules' (Nachtigal 1979:124, 282-283).

Wheeled gun-carriages were also constructed in the second half of the nineteenth century in the kingdom of Zinder, to the north-west of Borno. King Tenimu of Zinder (1851-1884) was noted for developing the local manufacture of cannon, powder and shot. When his blacksmiths had cast some especially heavy cannon, it is reported that a visiting Arab showed them how to construct wheeled carriages to transport them (Tilho 1910-1914:II, 444, with n.2). Here too, however, these wheeled gun-carriages were never put to any practical use. Tenimu's cannon and their wheeled carriages are sometimes cited as if they represented a serious application of new technology to warfare (e.g. Smaldone 1979:99). In fact, the Zinder cannon were used merely to fire salutes at festivals; on the one recorded occasion when they were taken to war, in the 1890s, the wheeled carriages were not used, and the cannon exploded when fired (Tilho 1910-1914:I, 444 n.1, 527).

Wheeled gun-carriages were also occasionally found in the coastal areas of West Africa during the nineteenth century. In some contexts, Europeans might be reluctant to supply wheeled gun-carriages to Africans, presumably fearing that possession of mobile artillery would dangerously enhance the military power of the indigenous societies against themselves. Thus in the 1830s, when the king of Asante asked the Dutch on the Gold Coast to supply him with pieces of artillery, the Dutch took the precaution of selecting cannon mounted on immobile ship-carriages rather than on field-carriages (Wilks 1975:198). Nevertheless, West African rulers were occasionally able to procure wheeled carriages. Perhaps the earliest to do so was Kosoko, the king of Lagos, in the 1840s: when the British expelled Kosoko from Lagos in 1851, they found among his considerable collection of artillery pieces one four-pounder gun mounted on a 'travelling-carriage'.²⁴

In 1851 the British themselves supplied wheeled gun-carriages to the state of Abeokuta, in the hinterland of Lagos, which was then the centre of missionary influence in the area and under threat of attack from the neighbouring kingdom of Dahomey. Commander F. E. Forbes of the British navy travelled to Abeokuta to organize an artillery force there, and with the assistance of local carpenters constructed carriages for five cannon.²⁵ It does not appear, however, that these mounted cannon were ever put to any serious use. A subsequent British military mission to Abeokuta, in 1861, found that the cannon were neglected and the carriages decaying: one piece had been left for several months 'exposed to all the vicissitudes of the climate until one of the wheels has rotted, and the gun could not consequently travel a mile over the roads of the country without breaking down' (Jones 1861:131, 135). Burton in 1865 likewise asserted that the Abeokuta cannon had never taken the field, and could not be used

effectively even in defence of the town since 'the gun carriages are all worm eaten'.²⁶

At the same time, Abeokuta's enemy Dahomey was also acquiring wheeled gun-carriages, and here they were put to more effective use. The kings of Dahomey had acquired several cannon during the eighteenth and early nineteenth centuries, but these are explicitly reported to have been without carriages (see e.g. Norris 1789:92; Forbes 1851:I, 59). In 1851, however, the French government presented two pieces of 'mounted artillery' as a gift to the king.²⁷ As in Borno, it appears that these were subsequently imitated by local craftsmen, for Burton in 1864 reported that the Dahomians 'have made, I am told, tolerable gun-carriages', though he does not appear to have seen any himself (Burton 1966:110). When the Dahomians attacked Abeokuta in 1864, they took with them three guns mounted on locally made carriages. These, however, do not seem to have played any effective role in the fighting, one of the guns being captured by the Abeokuta forces when the Dahomians retreated (Burton 1966:360 with n.5, 363).

Conclusion

On the face of it, it might be argued that the foregoing material on wheeled transport in pre-colonial West Africa makes the reasons for the non-adoption of the wheel more rather than less obscure. The technology of the wheel was known, supplies of imported wheeled vehicles were available, and local craftsmen in such places as Dahomey and Borno proved capable of constructing serviceable wheeled vehicles locally. Yet interest in the wheel was largely restricted to the acquisition of carriages for use in ceremonial processions, and very secondarily to the use of wheeled vehicles in warfare, and there was no serious effort to utilize the wheel for the transport of goods. Why was the wheel not more widely adopted? The conventional notion that Africans failed to employ the wheel because of lack of initiative or intelligence is intellectually unsatisfactory, not so much because it is racist as because it is circular: Africans are supposed to have ignored the wheel because they were unenterprising, and the evidence that they were unenterprising is that they failed to adopt the wheel. In other contexts, notably in their widespread adoption of the use of imported European firearms, Africans proved eagerly receptive to innovation, and it cannot therefore be argued that they were in general conservative in their responses to new technology. There must, logically, be some special explanation for their lack of interest in the practical application of the technology of wheeled transport. But what were the factors given which inhibited its adoption?

The detailed evidence given above goes a long way to substantiate the general arguments of McPhee and Hopkins cited at the beginning of the article. There are thus numerous illustrations of the problems caused in the coastal areas of West Africa by the lack of draught animals and the high cost of using human labour to move wheeled vehicles. There are also several explicit references to the difficulties arising from the lack of roads suitable for wheeled traffic. The technology of the wheel was available, but the poor quality of the roads discouraged its use. As the Reverend C. C. Reindorf complained in the Gold Coast in the 1880s: 'We have the wheel-wrights but where are the roads?' (Reindorf 1951:275). This, however, merely raises the further question of why West African societies were unwilling to undertake the work of road improvement needed to make wheeled transport feasible. Projects of road improvement were certainly not beyond the imagination or the administrative capacity of pre-colonial

West African governments: in the 1770s, for example, the king of Dahomey ordered the construction of a good road ten yards wide from his capital down to the coast, involving the clearing of vegetation and the laying of hurdles in swampy ground (Dalzel 1793:171; cf. Burton 1966:114), and in the 1810s the king of Asante issued similar orders for the widening and straightening of the roads in his kingdom (Wilks 1975:33–34). Wheeled vehicles, however, required better roads than pack animals or human porters, and it might well appear that the enormous costs involved would outweigh any likely advantages. The Methodist missionaries who brought the wheeled carriage to the king of Asante in 1841 were exultant that its delivery had necessitated the construction of a road: ‘Our bringing the carriage is the cause of a better road being made through this part of Ashanti, than has ever been seen before . . . good roads greatly promote civilization, and are a universal indication of national improvement’ (Freeman 1844:118–119). But it was nonsensical to advocate the introduction of wheeled transport in order to stimulate road improvement: heavy expenditure on road improvement would only be attractive if wheeled transport promised commensurate savings, and the experience of 1841 might equally reasonably have prompted the discouraging conclusion that the costs involved were so great as to be prohibitive. The costs of road improvement, moreover, would have to be incurred in advance of any savings to be derived from the use of wheeled vehicles, and thus represented a very speculative venture as long as wheeled vehicles were not already in general use. Even the British colonial government in the Gold Coast balked at the gamble in 1870, concluding that roads suitable for wheeled traffic would be too expensive to build and were in any case undesirable since ‘even if good roads were built, there would be no vehicles to travel on them’ (Dickson 1971:218–219). Thus, wheeled transport could not be adopted without improved roads, but the roads would not be improved as long as there was no wheeled transport to use them. Only governments committed to a more aggressive ideology of economic progress, and therefore ready to incur speculative expenses in the confidence of ultimate economic advantage, could break out of this vicious circle; and such governments arrived in West Africa only with the European imperialism of the late nineteenth century.

NOTES

¹ Cf. Hopkins, 1973, pp.71–73. The lack of the wheel also had important implications in fields other than transport, making it impossible to harness wind and water power and limiting the possibilities of irrigation: cf. Goody, 1971, pp.26–27.

² A remarkable example of this neglect of a crucial topic, especially in view of his argument that the technological gap between Africa and Europe was small prior to the Atlantic slave trade, is provided by Rodney, 1972.

³ In c.1178 B.C. the Egyptians captured 93 chariots in a campaign against Libyan invaders from Cyrenaica: Breasted, 1906–7, IV, p.66.

⁴ According to White, 1962, pp.59–61, the modern horse harness appeared in the West only in the ninth century A.D.; but Bulliett, 1975, pp.197–201, argues that harnesses utilizing collar and breast-strap were already known in northern Africa during Roman times.

⁵ For the Saharan chariots, see esp. Lhote, 1953. For some of the more recent discoveries, cf. Lhote, 1957; Lhote, 1970; Munson, 1969. See also Mauny, 1978, pp.279–284.

⁶ See, for example, for the disappearance of war chariots in Classical Greece, Garland, 1975, p.118.

⁷ The last reference to the use of war chariots in northern Africa is of 307 B.C.: Diodorus Siculus, xx.38, 1 & 64, 3. The earliest reference to the use of cavalry by indigenous North Africans is of 262 B.C.: Polybius, i,19,2.

⁸ Strabo, xvii, 3, 7. Strabo might, of course, be repeating information from an earlier writer rather than reporting contemporary conditions: a likely source is Posidonius, a writer of the first century B.C.

⁹ See the early Arabic accounts collected together in Cuoq, 1975.

¹⁰ Lhote, 1953, p.1159, on the authority of Marcel Griaule.

¹¹ Labat, 1730, II, pp.289–290. A later source repeats Labat's speculation as an unqualified assertion: Astley, 1746, III, p.66.

¹² Readers of d'Elbée should not be misled by his statement (1671, p.392) that the king of Allada instructed his son to 'se transporter en diligence' to the coast to meet the French party. The phrase 'en diligence' here must mean simply 'in haste' and not, as in later French, 'in a stage-coach': for elucidation of this point I am grateful to Andrew Walker of the University of Stirling. When the king's son appeared at the coast, he was in fact conveyed in a hammock: *ibid.*, p.402.

¹³ The existence of horses (but not of carriages) at Allada had been noted earlier by Dapper, 1668, p.489.

¹⁴ Dunglas, 1957, p.116, in an account purportedly based upon d'Elbée, describes the king of Allada making a ceremonial entry into his capital in the carriage, drawn by twenty men; but no such statement is made anywhere in d'Elbée's original account.

¹⁵ In the 1770s there were said to be only 16 horses in Dahomey: Akinjogbin, 1967, p.147.

¹⁶ Parliamentary Papers (hereafter, PP), 1849 (399), vol.XXXIV, Journal of Governor Winniet, entry for 21 Oct. 1848: cf. Wilks, 1975, p.200.

¹⁷ Methodist Missionary Society Archives, London, Box 260, Rev. S. Annear to General Secretary, 8 March 1845.

¹⁸ PP, 1883 (c.3687), vol.XLVIII, Henry Higgins, 'Fourth Monthly Report on the Tarquah Gold Mining District', 31 July 1882, & 'Fifth Monthly Report on the Tarquah Gold Mining District', 31 Aug. 1882.

¹⁹ The practice was noted on the Gold Coast in the late seventeenth century: Barbot, 1732, p.171.

²⁰ PP, 1893–4 (c.7225) vol.LX, Sir W. B. Griffith to Marquess of Ripon, 12 June 1893.

²¹ The practice is noted in Dahomey by Manning, 1969a, p.107, citing accounts dated 1900. In another publication (1969b, p.287) Manning asserts that cask-rolling was also practised in Dahomey in pre-colonial times, along the entire distance of about 90 miles between the capital at Abomey and the coast; but he cites no evidence, and the suggestion is most improbable.

²² PP, 1893–4 (c.7225) vol.LX, Sir W. B. Griffith to Marquess of Ripon, 12 June 1893.

²³ Smith, 1976, p.113, cites an account suggesting the use of gun-carriages by an indigenous ruler on the Gabon coast in the seventeenth century. However, the original source of this account refers rather to 'bases', implying a wheel-less form of mounting: cf. Patterson, 1975, p.19.

²⁴ PP, 1852 (1455), vol.LIV, Commodore Coote to Captain Jones, 29 Dec. 1851.

²⁵ *Ibid.*, Commander F. E. Forbes to Commodore Bruce, 9 Dec. 1851.

²⁶ PP, 1865 (412), vol.V, Minutes of evidence of Captain R. F. Burton, sections 2366–2367. However, at least one cannon mounted on a carriage was used in the defence of Abeokuta against the Dahomian attack of 1864: Burton, 1966, p.361.

²⁷ Archives Nationales, Paris, Section Outre-Mer, Afrique IV, 9(b), Régis to Ministre des Colonies, 11 Jan. 1851; *Ibid.*, Afrique, IV, 9(c), Ministre des Colonies to Gezo, 8 Feb. 1851.

REFERENCES

- Akinjogbin, I. A. 1967 *Dahomey and its neighbours 1708–1818*. Cambridge: Cambridge University Press.
- Allen, W., & T. R. H. Thomson 1848 *Narrative of the expedition sent by Her Majesty's Government to the River Niger in 1841*. 2 vols. Reprinted London: Frank Cass, 1968.
- Astley, Thomas 1746 *A new and general collection of voyages and travels*. 4 vols. Reprinted London, Frank Cass, 1968.
- Barbot, John 1732 *A description of the coasts of North and South Guinea*. London.
- Bauer, P. T. 1966 *Economic analysis and policy in underdeveloped countries*. 2nd impression. London: Routledge & Kegan Paul.
- Bohner, Theodor, 1934 *Der eroberte Erdteil: Deutsches Schicksal in Afrika um Gustav Nachtigal*. Berlin: Büchergilde Gutenberg.
- Breasted, J. H. 1906–7 *Ancient records of Egypt*. 5 vols. Chicago.
- Bulliett, Richard W. 1975 *The camel and the wheel*. Cambridge, Mass.: Harvard University Press.
- Burton, Richard 1966 *A mission to Gelele, king of Dahome*. Edited by C. W. Newbury. London: Routledge & Kegan Paul.

- Cruikshank, Brodie 1853 *Eighteen years on the Gold Coast of Africa*. Reprinted London: Frank Cass, 1966.
- Cuoq, Joseph M. 1975 *Recueil des sources arabes concernant l'Afrique occidentale du VIIIe au XVIIe siècle*. Paris: Maisonneuve et Larose.
- Dalzel, Archibald 1793 *The history of Dahomy*. Reprinted London: Frank Cass, 1967.
- Dapper, Olfert 1668 *Naukeurige beschrijvinge der Afrikaensche gewesten*. Amsterdam.
- Denham, D., & H. Clapperton 1826 *Narrative of travels and discoveries in Northern and Central Africa*. London.
- Dickson, K. B. 1971 *A historical geography of Ghana*. Cambridge: Cambridge University Press.
- Diodorus Siculus *Library of history*. Edited and with an English translation by C. H. Oldfather et al. 12 vols. London: Heinemann, 1933-67.
- Duncan, John 1847 *Travels in Western Africa*. Reprinted London: Frank Cass, 1968.
- Dunglas, E. 1957 'Contribution à l'histoire du Moyen-Dahomey,' tome I, *Etudes dahoméennes*, XIX.
- d'Elbée 1671 'Journal du voyage du Sieur d'Elbée,' in J. de Clodoré, *Relation de ce qui s'est passé dans les isles et terre-ferme de l'Amérique pendant la dernière guerre avec l'Angleterre* (Paris, 1671), II, pp.347-494.
- Fage, J. D. 1978 *A history of Africa*. London: Hutchinson.
- Forbes, F. E. 1851 *Dahomey and the Dahomans*. 2 vols. Reprinted London: Frank Cass, 1966.
- Freeman, T. B. 1844 *Journal of various visits to the kingdoms of Ashanti, Aku and Dahomi*. Reprinted London: Frank Cass, 1968.
- Fyfe, Christopher 1962 *A history of Sierra Leone*. London: Oxford University Press.
- Garlan, Yvon 1975 *War in the ancient world*. London: Chatto & Windus.
- Goody, Jack 1971 *Technology, tradition and the state of Africa*. London: Oxford University Press, for International African Institute.
- Herodotus, *Histories*. Edited by C. Hude. 2 vols. Oxford: Clarendon Press, 1908.
- Hopkins, A. G. 1973 *An economic history of West Africa*. London: Longman.
- Hutchinson, T. J. 1858 *Impressions of Western Africa*. Reprinted London: Frank Cass, 1970.
- Jones, A. T. 1861 'Report on the Egba army,' in J. F. A. Ajayi & R. S. Smith, *Yoruba warfare in the nineteenth century* (2nd edition, Cambridge: Cambridge University Press, 1971), pp.129-140.
- Labat, J.-B. 1730 *Voyage du Chevalier des Marchais*. 4 vols. Paris.
- Laird, M. & R. A. K. Oldfield 1837 *Narrative of an expedition into the interior of Africa*, 2 vols. Reprinted London: Frank Cass, 1971.
- Law, R. 1967 'The Garamantes and trans-Saharan enterprises in Classical times,' *Journal of African History*, VIII, 181-200.
- Lhote, Henri 1953 'Le cheval et le chameau dans les peintures et gravures rupestres du Sahara,' *Bulletin de l'I.F.A.N.*, XV, pp.1138-1228.
- 1957 'Les gravures rupestres d'Aouineght (Sahara occidental): nouvelle contribution à l'étude des chars rupestres du Sahara,' *Bulletin de l'I.F.A.N.*, XIX, pp.617-658.
- 1970 'Découverte de chars de guerre en Air,' *Notes africaines*, 127, pp.83-85.
- Manning, Patrick 1969a 'An economic history of Dahomey, 1880-1914,' Ph.D. thesis, University of Wisconsin.
- 1969b 'Slaves, palm oil and political power on the West African coast,' *African Historical Studies*, II, 279-288.
- Mauny, Raymond 1947 'Une route préhistorique à travers le Sahara occidental,' *Bulletin de l'I.F.A.N.*, IX, 341-357.
- 1978 'Trans-Saharan contacts and the Iron Age in West Africa,' in *The Cambridge History of Africa*, II (Cambridge: Cambridge University Press, 1978), 272-341.
- McPhee, Allan 1926 *The economic revolution in British West Africa*. Reprinted London: Frank Cass, 1971.
- Munson, P., & C. A. Munson 1969 'Nouveaux chars à boeuf rupestres du Dhar Tichitt (Mauritanie),' *Notes africaines*, 122, 62-63.
- Nachtigal, Gustav 1979 *Sahara and Sudan*, translated by A. G. B. Fisher & H. J. Fisher, vol. II. London: C. Hurst.

- Norris, Robert 1789 *Memoirs of the reign of Bossa Ahadee, king of Dahomy*. Reprinted London: Frank Cass, 1968.
- Parliamentary Papers 1849 (399), vol.XXXIV, Missions to the King of Ashanti and Dohomey [sic].
- 1852 (1455), vol.LIV, Papers relative to the Reduction of Lagos.
- 1865 (412), vol.V, Report from the Select Committee on the State of the British Settlements on the Western Coast of Africa.
- 1883 (c.3687), vol.XLVIII, Further correspondence regarding the affairs of the Gold Coast.
- 1893-4 (c.7225), vol.LX, Despatch from Governor Sir W. Brandford Griffith forwarding a Memorial from Merchants, Agents, and Traders of the Gold Coast Colony.
- Patterson, K. David 1975 *The northern Gabon coast to 1875*. Oxford: Clarendon Press.
- Pliny, *Naturalis historia*. Edited and with an English translation by R. Rackham *et al.* 10 vols. London: Heinemann, 1938-63
- Polybius, *Histories*. Edited and with an English translation by W. R. Paton. 6 vols. London: Heinemann, 1922-7.
- Reindorf, C. C. 1951 *The history of the Gold Coast and Asante*. Second edition. Reprinted Accra: Ghana Universities Press, 1966.
- Reynolds, Edward 1974 *Trade and economic change on the Gold Coast 1807-1874*. London: Longman.
- Rodney, Walter 1972 *How Europe underdeveloped Africa*. London: Bogle-L'Ouverture Publications.
- Rouch, Jean 1949 'Gravures rupestres de Kourki (Niger),' *Bulletin de l'I.F.A.N.*, XI, 340-347.
- Schön, J. F., & S. Crowther 1842 *Journals of the Reverend James Frederick Schön and Mr Samuel Crowther, who . . . accompanied the expedition up the River Niger in 1841*. Reprinted London: Frank Cass, 1970.
- Skertchly, J. A. 1875 *Dahomey as it is*. London.
- Smaldore, J. P. 1977 *Warfare in the Sokoto Caliphate*. Cambridge: Cambridge University Press.
- Smith, Robert S. 1976 *Warfare and diplomacy in pre-colonial West Africa*. London: Methuen.
- Strabo, *Geography*. Edited and with an English translation by H. L. Jones. 8 vols. London: Heinemann, 1917-32.
- Tarr, László 1969 *The history of the carriage*. London: Vision Press.
- Tilho 1910-1914 *Documents scientifiques de la Mission Tilho*. 3 vols. Paris.
- Verger, Pierre 1976 *Trade relations between the Bight of Benin and Bahia from the 17th to the 19th century*. Ibadan: Ibadan University Press.
- Waddell, Hope Masterton 1863 *Twenty-nine years in the West Indies and Central Africa*. Reprinted London: Frank Cass, 1970.
- White, Lynn 1962 *Medieval technology and social change*. London: Oxford University Press.
- Wilks, Ivor 1975 *Asante in the nineteenth century*. Cambridge: Cambridge University Press.

Résumé

Le transport par roue dans l'Afrique Occidentale pré-coloniale

Le présent article étudie ce que l'on sait des tentatives qui ont été faites, à l'époque pré-coloniale, pour introduire le transport par roue en Afrique Occidentale, dans l'espoir de jeter quelque lumière sur les raisons pour lesquelles ce mode de transport ne fut pas adopté par les Africains de l'Ouest. L'introduction de véhicules à roues au Sahara et leur disparition ultérieure sont examinées brièvement, cette disparition servant à démontrer qu'il ne faut pas nécessairement conclure, de façon décisive, à la supériorité des véhicules à roues sur les bêtes de somme. Puis sont passés en revue plusieurs exemples d'importation, à partir du dix-

septième siècle, de véhicules à roues en provenance d'Europe. Il est montré qu'il était facile aux sociétés d'Afrique Occidentale de se procurer des véhicules à roues, que certains chefs africains se montrèrent très désireux d'acquérir de tels véhicules et que, dans certains cas, il en fut fabriqué par des artisans locaux. Cependant, les véhicules à roues étaient généralement utilisés pour les cérémonies, accessoirement aussi pour la guerre, et il existe peu de preuves que l'adoption du transport par roue pour la circulation des biens ait suscité un intérêt véritable. Il est suggéré que c'est, avant tout, la mauvaise qualité des routes locales qui a entravé l'adoption de ce mode de transport.